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57. (Amended) The ink-jet recording medium of claim 56, wherein the glossy coating has a total mercury intrusion volume of about 0.8 ml/g or more.

#### REMARKS

##### *The Pending Claims*

Claims 1-3, 5, 7, 27-30, 33, 44-53, and 55-57 are pending, which are directed to ink-jet recording media.

##### *The Amendments to the Claims*

All of the pending claims have been amended to recite an "ink-jet recording medium," in accordance with the specification, for example, at page 1, lines 16-20; page 5, line 36 - page 6, line 5; page 6, lines 11-15; page 8, lines 30-32; page 11, lines 17-24; page 12, lines 1-5; page 14, line 32 - page 15, line 2. The pending claims also have been amended to recite "fumed alumina," as previously recited in claim 4. Claim 4 has been cancelled. In view of the cancellation of claim 4, claims 49, 52, 55, and 56 have been amended so as to depend from claim 27. Claims 1, 5, 7, 27, 28, 44-49, 52, 53, and 55-57 have been amended to change certain other claim language, as per the Office Action's suggestions. Claim 27 also has been amended to recite that the alumina particles have a surface area of about 30-80 m<sup>2</sup>/g, as supported by the specification, for example, at page 10, line 1. Claim 33 has been amended so as to depend from claim 1. No new matter has been added by way of these amendments. The precise amendments to the claims, as well as the text of all of the pending claims as amended, are set forth in attachments A and B, included herewith.

##### *The Office Action*

The Office Action rejects claims 1, 5, 7, 27, 28, 33, 44-49, 52, 53, and 55-57 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. The Office Action rejects claims 27 and 28 under 35 U.S.C. § 102(b) as allegedly anticipated by EP 0 803 374 A2 (Liu et al.). The Office Action also rejects claims 1-5, 29, 30, 33, 46-51, and 54-57 under 35 U.S.C. §§ 102(e) and 103(a) as allegedly anticipated by, or obvious in view of, U.S. 6,124,031 (Yoshida et al.). The Office Action rejects claims 1, 4, 5, 7, 29, 30, 33 and 44-57 under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent 6,096,157 (Imabeppu et al.), alone or in combination with U.S. Patent 6,187,419 (Kijimuta et al.)

*Discussion of the Section 112, Second Paragraph, Rejections*

The Office Action rejects claim 33 as depending from a cancelled claim. Claim 33 has been amended so as to depend from claim 1. Accordingly, this rejection is moot.

The Office Action rejects claims 1, 5, 7, 27, 28, 44-49, 52, 53, and 55-57 as allegedly indefinite for recitation of the phrases “at least about” and “less than about.” The Office Action indicates that the basis for this rejection is set forth in Paragraph 7 of the prior Office Action dated April 9, 2002. Applicants disagree with this rejection for the reasons set forth in their prior Response to Office Action. Nevertheless, the pending claims have been amended as per the Office Action’s suggestions. These amendments do not in any way alter the scope of the pending claims, and are made solely in the interest of expediting the prosecution of this application. Accordingly, this rejection is moot.

*Discussion of the Section 102(b) Rejection Over Liu et al.*

The Office Action contends that claims 27 and 28 are anticipated by the Liu et al. reference. The Office Action indicates that the basis for this rejection is set forth in the prior Office Action dated April 9, 2002. According to paragraph 9 of the April 9th Office Action, the Liu et al. reference allegedly discloses a recording medium comprising a substrate having a coating thereon, wherein the coating comprises alumina particles and a binder, and the alumina particles are aggregates of primary particles. The Section 102(b) rejection over the Liu et al. reference presented in the April 9th Office Action applied to claims 1-5, 7, 8, 13, and 24-30. The rejection now applies only to claims 27 and 28, and has apparently been withdrawn with respect to the other claims (Office Action dated November 1, 2002 at page 12, paragraph 11). Applicants traverse this rejection.

As discussed in Applicants’ prior Response to Office Action, the Liu et al. reference does not disclose the use of *alumina* particles, as recited in the pending claims. Instead, the Liu et al. reference is specifically directed to the use of silica or *alumina silicate* particles. Those of ordinary skill in the art appreciate that alumina ( $\text{Al}_2\text{O}_3$ ) and alumina silicate  $((\text{Al}_2\text{O}_3)_x(\text{SiO}_2)_y(\text{H}_2\text{O})_z)$  are distinctly different materials having significantly different chemical and physical properties. However, the Office Action asserts that the alumina silicate particles of the Liu et al. reference read on the limitation “comprising alumina particles” because alumina silicate contains alumina moieties and silica moieties (Office Action dated November 1, 2002, page 13).

Contrary to the Office Action’s allegations, alumina silicate particles do not comprise alumina particles. Although alumina silicate may comprise alumina *moieties*, a moiety is not a particle. A moiety is typically defined as a functional group of a molecule. In this case, the alumina moiety is a component of the crystalline structure of alumina silicate (*i.e.*, part of the

molecular structure of alumina silicate). It is for this reason that the alumina cannot be separated from alumina silicate (Liu et al. at p. 6, lines 5-8). In other words, alumina silicate cannot be broken down into silica particles and alumina particles. Thus, the Liu et al. reference does not disclose the use of alumina particles, as recited in the pending claims.

Although Applicants believe that these differences are sufficient to distinguish the invention recited in originally filed claims 27 and 28 from the disclosure of the Liu et al. reference, the amended claims are even further removed from the disclosure of the Liu et al. reference. In particular, all of the pending claims are directed to the use of *fumed* alumina particles with *a surface area of about 30-80 m<sup>2</sup>/g*. The Liu et al. reference does not disclose the use of any alumina particles, much less fumed alumina particles. Furthermore, the Liu et al. does not disclose the use of particles having any particular surface area, much less alumina particles having the surface area recited in claims 27 and 28.

As the Liu et al. reference does not disclose all of the elements recited in the pending claims, it cannot anticipate the pending claims. Moreover, nothing in the Liu et al. reference, or any other reference cited in the Office Action, suggests any modification of the disclosure thereof that would lead one of ordinary skill in the art to the subject matter of the pending claims. Accordingly, the Section 102(b) rejection of claims 27 and 28 over the Liu et al. reference should be withdrawn.

*Discussion of the Section 102(e) Rejection Over Yoshida et al.*

The Office Action rejects claims 1-5, 29, 30, 33, 46-51, and 54-57 as allegedly anticipated by, or obvious in view of, the Yoshida et al. reference. In particular, the Office Action alleges that the Yoshida et al. reference discloses a recording medium comprising a substrate having a coating thereon, wherein the coating comprises alumina particles and a binder, the alumina particles are aggregates of primary particles, and the alumina particles have a surface area of about 30-80 m<sup>2</sup>/g. Applicants traverse this rejection.

Contrary to the Office Action's assertions, the Yoshida et al. reference does not disclose all of the elements of the pending claims. In particular, the Yoshida et al. reference does not disclose (a) an ink-jet recording medium, (b) a glossy coating comprising alumina particles, or (c) fumed alumina particles, as recited in the pending claims.

As discussed in Applicants' prior Responses to Office Action (dated December 18, 2001 and August 7, 2002), the Yoshida et al. reference is directed to "a thermoplastic polyester composition and films made therefrom ... excellent in slipping property, abrasion resistance, and scratch resistance by dispersing fine aluminum oxide particles ... in the thermoplastic polymer composition" (*see, e.g.*, column 1, lines 5-14 (under the heading "Technical Field of the Invention")). The polyester film disclosed in the Yoshida et al.

reference is of the type used for producing magnetic tape (*i.e.*, a magnetic recording medium). Neither the polyester film nor the magnetic recording medium of the Yoshida et al. reference is an “ink-jet recording medium.”

Furthermore, even if the Yoshida et al. reference disclosed an “ink-jet recording medium”, which it does not, the Yoshida et al. reference does not disclose a *glossy coating comprising alumina particles*, as recited in the pending claims. To the contrary, *the Yoshida et al. reference discloses only the use of alumina particles embedded within the film itself* (see, *e.g.*, column 2, lines 5-10). Indeed, the only place that the Yoshida et al. so much as mentions the use of a coating of any kind is at col. 16, line 65 – col. 17, line 27, wherein a magnetic coating solution is applied to the polyester film. The composition of the magnetic coating is provided therein; it does not comprise alumina particles.

Moreover, the Yoshida et al. reference does not disclose the use of *fumed alumina particles*, as recited in the pending claims. Instead, the Yoshida et al. reference discloses the use of rod or platelike alumina particles prepared by calcining aluminum hydroxide (Yoshida et al. at col. 2, lines 20-67, and col. 3, lines 25-27). The distinction between fumed alumina and other types of alumina is widely recognized in the art.

As the Yoshida et al. reference does not disclose all of the elements recited in the pending claims, the Yoshida et al. reference does not anticipate the subject matter of the pending claims. Accordingly, the Section 102(e) rejection based on the Yoshida et al. reference should be withdrawn.

#### *Discussion of the Section 103(a) Rejection Over Yoshida et al.*

Applicants maintain that Yoshida et al. is non-analogous art with respect to the present invention for the reasons set forth in their prior response. However, even if the Yoshida et al. reference could be considered analogous to the present invention, the Yoshida et al. reference does not disclose several elements of the pending claims, as discussed above with respect to the Section 102(e) rejection. Moreover, there is no teaching or suggestion in the Yoshida et al. reference, or any other cited reference, to modify the disclosure of Yoshida et al. in such a way as to arrive at the subject matter recited in the pending claims. Accordingly, the subject matter recited in the pending claims is unobvious in view of the Yoshida et al. reference, and the Section 103(a) rejection should be withdrawn.

#### *Discussion of the Section 103(a) Rejection Over Imabeppu et al.*

The Office Action alleges that claims 1, 4, 5, 7, 29, 30, 33, 45-57 are obvious in view of the Imabeppu et al. reference. Specifically, the Office Action alleges that the Imabeppu et al. reference discloses a recording medium comprising a substrate having a

glossy coating thereon, wherein the glossy coating comprises alumina particles and a binder, and wherein the alumina particles are aggregates of primary particles with a surface area of about 30-80 m<sup>2</sup>/g. Applicants traverse this rejection.

The Imabeppu et al. reference does not disclose several elements of the pending claims. In particular, the Imabeppu et al. reference does not disclose (a) a glossy coating comprising alumina particles, and (b) the use of fumed alumina particles. The Imabeppu et al. reference is directed to a cast coated paper with 3 layers: a base layer, an undercoating layer comprising alumina, and a cast-coating layer comprising a resin (*see, e.g.*, column 2, lines 8-14). The cast-coating layer of Imabeppu et al. is the glossy layer of the recording medium disclosed therein (Imabeppu et al. at col. 6, lines 33-34). The Imabeppu et al. reference discloses the use of alumina particles in the undercoating layer, but does not disclose or suggest the use of alumina particles in the cast-coating layer. Thus, the Imabeppu et al. reference does not disclose this element of the pending claims.

Furthermore, the Imabeppu et al. reference does not disclose the use of *fumed* alumina particles. As in the Yoshida et al. reference, the Imabeppu et al. reference discloses the use of a "fine particulate form" of alumina prepared by calcination of an aluminum hydroxide (Imabeppu et al. at col. 3, lines 62-67). Nothing in Imabeppu et al. suggests the use of any other type of alumina particles. As previously discussed with respect to Yoshida et al., fine alumina particles of the type disclosed in Imabeppu et al. is significantly different from fumed silica.

The Office Action relies upon the Kijimuta et al. reference for its alleged disclosure of particular substrates. However, the Kijimuta et al. reference does not supply the missing disclosures of the Imabeppu et al. reference. In particular, the Kijimuta et al. reference does not disclose the use of fumed alumina particles in a glossy coating, nor does it disclose the use of alumina particles having any particular surface area characteristics, much less an aggregate alumina particle having a surface area of 30-80 m<sup>2</sup>/g, as recited in the pending claims.

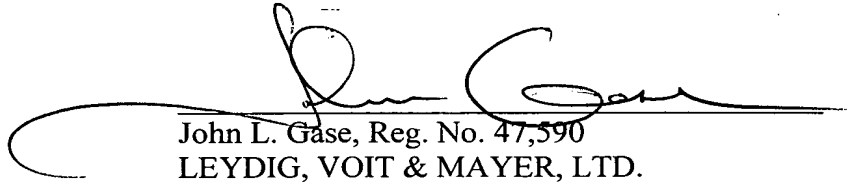
As the Imabeppu et al. reference, alone or in conjunction with the other cited references, does not disclose or suggest all elements of the pending claims, the Section 103(a) rejection based on Imabeppu et al. should be withdrawn.

### *Conclusion*

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

In re Appln. of Darsillo et al.  
Application No. 09/670,118

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'John L. Gase', is written over a horizontal line. The signature is fluid and cursive, with a large loop at the end.

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Date: March 31, 2003

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Darsillo et al.

Application No. 09/670,118

Filed: September 26, 2000

For: RECORDING MEDIUM

Art Unit: 1773

Examiner: Bernatz, Kevin M.

**AMENDMENTS TO CLAIMS  
MADE IN RESPONSE TO OFFICE ACTION DATED NOVEMBER 1, 2002**

*Amendments to existing claims:*

1. (Twice Amended) An ink-jet [A] recording medium comprising a substrate having a glossy coating thereon, the glossy coating comprising fumed alumina particles and a binder, wherein the fumed alumina particles [are aggregates of primary particles and] have a surface area of about 30-80 m<sup>2</sup>/g, and the glossy coating has a 75° specular gloss of [at least] about 15% or more.

2. (Amended) The ink-jet recording medium of claim 1, wherein the substrate comprises a polymer or cellulose paper.

3. (Amended) The ink-jet recording medium of claim 1, wherein the substrate comprises poly(ethylene terephthalate).

5. (Amended) The ink-jet recording medium of claim 1, wherein the fumed alumina particles [aggregates] have a mean diameter of [less than] about 1 µm or less.

7. (Twice Amended) The ink-jet recording medium of claim 1, wherein the alumina to binder ratio is [at least] about 2:1 by weight or more.

27. (Twice Amended) An ink-jet [A] recording medium prepared by a method comprising

- (a) providing a substrate,
- (b) coating the substrate with a coating composition comprising fumed alumina particles and a binder, wherein the fumed alumina particles [are aggregates of primary particles] and have a surface area of about 30-80 m<sup>2</sup>/g, and the solids content of the alumina in the composition is [at least] about 10 wt.% or more, and
- (c) drying the coated substrate to provide the ink-jet recording medium.

28. (Twice Amended) The ink-jet recording medium of claim 27, wherein the coating composition has a solids content of alumina in the composition of [at least] about 20 wt.% or more.

29. (Amended) The ink-jet recording medium of claim 5, wherein the fumed alumina particles [aggregates] have a mean diameter of about 80-300 nm.

30. (Amended) The ink-jet recording medium of claim 29, wherein the fumed alumina particles [aggregates] have a mean diameter of about 100-200 nm.

33. (Amended) The ink-jet recording medium of claim 1 [32], wherein the fumed alumina particles [aggregates] have a surface area of about 40-60 m<sup>2</sup>/g.

44. (Amended) The ink-jet recording medium of claim 7, wherein the alumina to binder ratio is [at least] about 7:1 by weight or more.

45. (Amended) The ink-jet recording medium of claim 44, wherein the alumina to binder ratio is [at least] about 9:1 by weight or more.

46. (Amended) The ink-jet recording medium of claim 1, wherein the glossy coating has a 75° specular gloss of [at least] about 65% or more.

47. (Amended) The ink-jet recording medium of claim 1, wherein the glossy coating has a total mercury intrusion volume of [at least] about 0.3 ml/g or more.

48. (Amended) The ink-jet recording medium of claim 47, wherein the glossy coating has a total mercury intrusion volume of [at least] about 0.8 ml/g or more.



49. (Amended) The ink-jet recording medium of claim 27 [4], wherein the fumed alumina particles [aggregates] have a mean diameter of [less than] about 1  $\mu\text{m}$  or less.

50. (Amended) The ink-jet recording medium of claim 49, wherein the fumed alumina particles [aggregates] have a mean diameter of about 80-300 nm.

51. (Amended) The ink-jet recording medium of claim 50, wherein the fumed alumina particles [aggregates] have a mean diameter of about 100-200 nm.

52. (Amended) The ink-jet recording medium of claim 27 [4], wherein the alumina to binder ratio is [at least] about 65% or more.

53. (Amended) The ink-jet recording medium of claim 52, wherein the alumina to binder ratio is [at least] about 9:1 by weight or more.

55. (Amended) The ink-jet recording medium of claim 27 [4], wherein the glossy coating has a 75° specular gloss of [at least] about 65% or more.

56. (Amended) The ink-jet recording medium of claim 27 [4], wherein the glossy coating has a total mercury intrusion volume of [at least] about 0.3 ml/g or more.

57. (Amended) The ink-jet recording medium of claim 56, wherein the glossy coating has a total mercury intrusion volume of [at least] about 0.8 ml/g or more.